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FM 10-6

WAR DEPARTMENT FIELD MANUAL

QUARTERMASTER SERVICE COMPANY

WAR DEPARTMENT • JANUARY 1946

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FM 10-6

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CHAPTER 1

GENERAL

1. PURPOSE AND SCOPE OF MANUAL. **a.** This manual will provide personnel of the quartermaster service company with condensed information on the organization, operation, and administration of the company. It consists of a compilation of basic information supplemented with references to pertinent Field Manuals, Technical Manuals, and other official publications which furnish the detailed information necessary for efficient company operations.

b. Headquarters to which service companies are attached or assigned will find the manual useful in planning the proper utilization of this company.

2. MISSION AND FUNCTIONS OF COMPANY. **a. Purpose of company.** The quartermaster service company provides military personnel for general labor. It is generally used as a "helping" unit to provide the additional labor personnel required by other units for the successful completion of their mission. The quartermaster service company may also be assigned independent missions, such as the operation of supply points, motor pools, laundries, etc. Personnel of the quartermaster service company may be used to furnish military labor or may be used to supervise civilian or prisoner of war labor.

b. Capabilities of company. The company can handle approximately 800 tons of assorted supplies per day. This figure is based on the assumption that each of the 160 laborers will handle one-half ton of supplies per hour for a 10-hour day. This capacity will vary with the type of supplies, the use of materials handling equipment, and the operating conditions (weather, tactical situation, familiarity with the work, etc.).

3. RELATIONSHIP OF COMPANY TO OTHER AGENCIES. Service companies, platoons, or sections may be attached to various types of units, or may function as a labor pool. In either case, the activity for which the service company personnel are working prescribes the work to be done and, where necessary, furnishes technical supervision. However, personnel of the service company work under the command of the officers and noncommissioned officers of the service company. It is necessary that the commanding officer of the service company (or platoon) work in close cooperation with the activity he is supporting. All personnel of both units must be informed of the exact chain of command. It is particularly important that proper utilization be made of the noncommissioned officers of the service company.

CHAPTER 2

ORGANIZATION AND ADMINISTRATION

4. ORGANIZATION OF THE COMPANY. The Quartermaster Service Company, T/O & E 10-67, consists of a company headquarters and two platoons (see fig. 1).

a. Company headquarters. Company headquarters performs the following functions:

(1) *Command.* The function of command is embodied in the company commander.

(2) *Personnel administration.* The executive officer, first sergeant, and company clerk perform the administrative details concerning the company personnel.

(3) *Mess.* The mess officer (see par. 6d), mess sergeant, and the cooks operate the company mess.

(4) *Supply.* The supply sergeant, through the supply officer (see par. 6d), is responsible for supply of individual and organizational equipment.

(5) *Operations.* The first sergeant, through the company commander, receives requisitions for work details and prepares rosters for the distribution of work.

b. Platoons. Each of the operating platoons is composed of a platoon headquarters and two sections. Each section is composed of four squads. The squad is the smallest operating unit of the company. Each squad must be trained to work as a team and should be kept intact whenever possible. Work details should be composed of squads or multiples of squads.

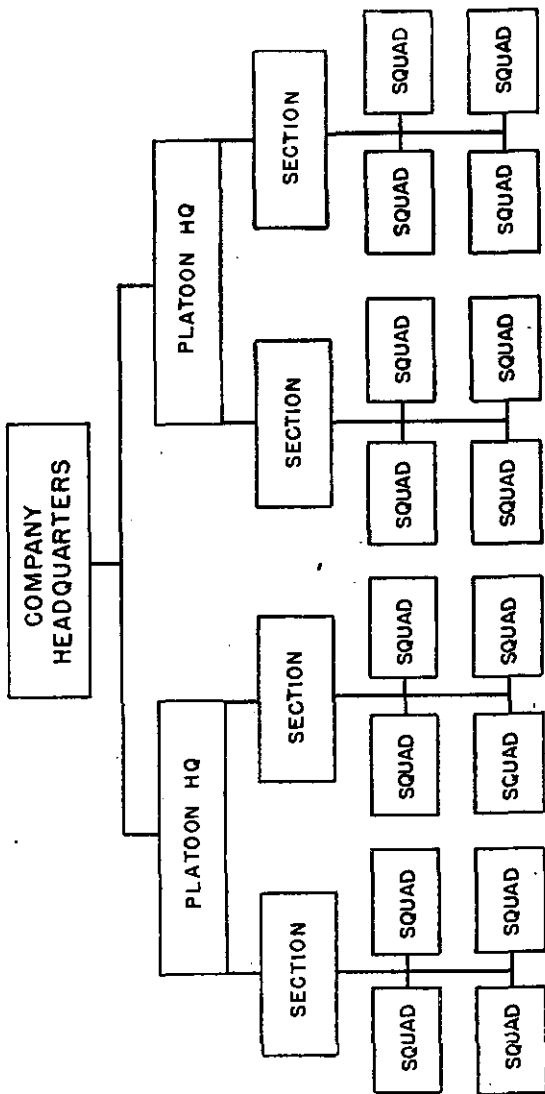


Figure 1. Organization of the quartermaster service company. The squad and multiples of squads are desirable work units.

c. Equipment of the company. The individual and organizational equipment of the quartermaster service company is prescribed by section II, T/O & E 10-67.

5. T/O & E 10-500. Labor detachments organized under T/O & E 10-500 provide labor personnel to supplement other quartermaster units. These detachments may be used to augment the quartermaster service company. In general, the instructions in this manual apply both to labor detachments and the service company.

6. DUTIES OF COMMISSIONED OFFICERS. a. General.

(1) All officers of a quartermaster service company must be familiar not only with service company operations but also with the operations of quartermaster units to which work details may be furnished. This knowledge is necessary for the efficient control of labor and for the development of work simplification methods. The officers of the company should analyze the type of work to be performed so as to develop proper sizes of work details and the most efficient methods of performing the work. The normal operations that the service company may be called upon to perform are described in section III, chapter 4. Unit standing operating procedures for all normal activities of the company must be developed and the unit trained in their operations.

(2) Leadership is extremely important in a service company officer. The use of tact and discretion in dealing with people, both of his own

unit and of those agencies with which his unit works, is essential to his success.

b. Company commander. The company commander is both the administrator of the company and the director of its operations. He is responsible for its efficient administration and for maintaining discipline. The administrative duties of the company commander are given in AR 245-5 and TM 12-250. As director of the company operations his duties include—

(1) Preparing training schedules and conducting training in accordance with the general policies dictated by higher authority.

(2) Receiving requisitions for work details and supervising the preparation of rosters assigning the men as requested.

(3) Supervising the work done by the company to be sure that the work is performed in accordance with directives issued by higher authority.

(4) Coordinating the administrative and operational phases of the company to insure adequate "housekeeping" and at the same time to keep the maximum number of men available for duty.

c. Executive officer. The executive officer is essentially an administrative officer. Since the service company must often perform its own personnel work, the executive officer takes over the responsibilities of a personnel adjutant; he is responsible for the service records, pay rolls, and personnel affairs of the company (see TM 12-250). The company commander is thereby relieved of those details so that he can give most of his time

to supervising and training his unit. The executive officer also shares the additional duties discussed in d (3) below.

d. Platoon leader. (1) The platoon leader of the quartermaster service company has the responsibility for the training and discipline inherent in any military organization. In addition, the platoon leader is a labor service officer responsible for the direction and supervision of his platoon, its proper training and operation, including both the tactical and the operational phases. Following the general instructions and training schedules of the company commander, he instructs and supervises the platoon personnel. He is responsible for seeing that the instructions of the company commander are carried out by the members of his platoon. Finally, he must instruct work details concerning their duties and responsibilities on all assignments.

(2) Each platoon leader should train his platoon, first to operate as part of the company team, and second to operate as a separate unit. When the platoon operates separately, the platoon leader functions as commander of the independent detachment and is responsible for the administration, transportation, supply, operation, and security of the unit. The platoon leader should be encouraged to act on his own initiative in order to be prepared to operate the platoon either as a separate detachment or as part of the company.

(3) When the company operates as a unit, platoon leaders (and the executive officer) are available for additional duties which may be assigned

by the company commander. Such duties include assignments as mess officer, supply officer, gas officer, security officer, malaria control officer, company censor, and such others as the situation demands. In delegating this authority, the company commander retains responsibility for the proper performance of these duties. However, he must free himself of these duties in order to have time to supervise and direct the company's operations.

7. DUTIES OF ENLISTED PERSONNEL. a. First sergeant.

The first sergeant is the senior noncommissioned officer of the company. He is the noncommissioned administrative assistant to the company commander. His duties are fully explained in TM 12-250 and TM 12-255. In addition to the normal duties of a first sergeant he will maintain the records of work that is performed, prepare rosters for the distribution of work, and maintain control records as directed.

b. Mess sergeant. (1) The mess sergeant is in immediate charge of the company mess, functioning as the noncommissioned assistant to the mess officer. He is charged with the supervision and control of mess personnel. His duties are discussed in detail in TM 12-250 and TM 10-205.

(2) The mess sergeant must coordinate the mess with the company operations. Food, in addition to the regular meals, must be provided for details which may be on duty at mealtime. When details are working at night, box lunches or spe-

cial type rations must be issued; whenever practicable hot meals should be provided.

c. Supply sergeant. The supply sergeant is the noncommissioned assistant to the company supply officer. He performs the normal duties of a supply sergeant as outlined in TM 12-250, TM 38-403, and related War Department publications. In addition, when in the field he must plan his work so as to be able to contact personnel when they are in the bivouac area. The collection of salvage and the issue of clothing and equipment must be coordinated with the company operations.

d. Platoon sergeant. (1) The platoon sergeant is the noncommissioned assistant to the platoon leader. He helps in training the platoon and in supervising both its tactical and technical operations. As labor foreman for the platoon, he uses the section and squad leaders in directing the work details.

(2) When the platoon is operating independently, the platoon sergeant assumes the duties of a first sergeant. During the training period, he should learn administrative procedure in order to be able to operate a separate platoon efficiently.

e. Section leader. The section leader is the labor foreman for the four squads composing his section. He must work with the squad leaders in supervising the work performed by details from the section.

f. Squad leader. Each squad leader is directly responsible for the discipline, training, and operations of the men assigned to his squad. He must study the men of his squad and train them to

work together. He is the labor foreman of his group and should see that the orders of the section leader and higher authorities are carried out correctly and efficiently.

g. Company clerk. The company clerk performs his duties as prescribed in TM 12-250. He must be familiar with all phases of personnel administration, since he, under the direction of the executive officer, must do all the personnel work when the company is operating separately without the facilities of a unit personnel section.

h. Cook. Each cook, under the supervision of the mess sergeant, helps prepare the food for the company. His duties are discussed in detail in TM 10-405. Information in the following manuals is essential in the performance of his duties: TM 10-205, TM 10-400, TM 10-407, TM 10-408, and TM 10-412.

i. Armorer-artificer. The armorer-artificer is the general utility man of the company. In addition to maintaining and servicing the small arms of the company, he does carpentry, painting, and similar repair work. In the field, the artificer constructs tables, showers, wash racks, and other expedients to improve the bivouac or billet area. When the service company expects to be in one location for several weeks, field installations constructed by the artificer contribute greatly to the health and comfort of the men. The following manuals contain information valuable to the armorer-artificer: TM 5-226, TM 9-867, TM 10-590, FM 21-10, and technical manuals pertaining to the weapons in the company.

j. Blacksmith. The blacksmith must be familiar with the information contained in the following manuals: TM 1-423, TM 1-430, and TM 9-2852.

k. Bugler. The bugler must be familiar with TM 20-250. In addition to his duties as bugler, he drives a truck and usually serves as messenger for the company commander.

l. Driver. Each driver must know the operation of his vehicle, first echelon maintenance, and loading. He must know TM 21-305 and the Technical Manual pertaining to his vehicle. When possible, drivers should learn the duties of mechanics.

m. Duty soldiers and basics. Duty soldiers and basics make up the work details requested of the service company. They work under the supervision of their noncommissioned officers and may perform any of the duties discussed in section III, chapter 4.

8. ASSIGNMENT. a. General. Quartermaster service companies are assigned to theater of operations headquarters, communications zone headquarters, armies, separate corps, or task forces on the basis of tonnage to be handled. Headquarters to which companies are assigned may attach them to any of their lower headquarters as the situation may require. The policy of assigning companies to higher headquarters and attaching them as needed to lower echelons has the effect of forming in each theater a labor pool which is broken into smaller operating units. This produces a flexible organization that can readily be adjusted to changes in the tactical situation.

b. Assignment as part of quartermaster battalion.

Normally, a quartermaster service company operates as part of a quartermaster battalion. The battalion is composed of a headquarters and headquarters detachment, T/O & E 10-536, and from three to six quartermaster companies. These may be service companies or a combination of different types of quartermaster companies, such as railhead, salvage repair, and laundry companies. The battalion supervises and coordinates the administration, training, operation, and supply of the companies assigned or attached to it. Quartermaster battalions may in turn be attached to a quartermaster group (T/O & E 10-22) for further centralization of control.

c. Assignment as separate company. The company may be attached to higher headquarters such as a port, division, or task force to furnish labor, or to supplement labor personnel of the organization. When the company is so attached, the company commander receives his instructions and operates according to standing operating procedures set up by the higher headquarters.

d. Assignment by Tables of Organization. Several Tables of Organization call for Quartermaster service companies to be assigned or attached as part of larger organizations. The more common of these are:

(1) Quartermaster Depot Company, Supply, T/O & E 10-227.

(2) Headquarters and Headquarters Company, Quartermaster Base Depot, T/O & E 10-520-1 (when necessary to supplement civilian labor).

e. Assignment as separate platoons. Platoons of the service company may be attached or assigned to organizations or task forces when the labor requirements do not justify the assignment of a whole company.

f. Assignment as installation complement. In the zone of interior, quartermaster service companies (or battalions comprised of service companies) are assigned to posts, camps, stations, ports, or depots for training purposes or for functional duty.

CHAPTER 3

TRAINING

9. OBJECTIVE OF TRAINING. The objective of the training period is to produce a well-trained service company ready for field duty. When the training period is completed, each man must be able to do his particular job, and the company must be able to perform its mission. Although training should continue after the company goes into the field, there is very little opportunity for comprehensive training. There is no time for such activity in a theater of operations. Therefore, company commanders and key personnel must utilize the training period in the zone of interior to bring the efficiency of the company as high as possible.

10. TRAINING PROGRAMS. **a. General.** Quartermaster service companies, organized, activated, and equipped under the direction of the Army Service Forces, are trained as prescribed by applicable mobilization training programs. The actual training is the responsibility of the company commander and, when the company is organized into a battalion, of the battalion commander.

b. Basic military training. Basic military training is designed either to convert the recruit from a civilian to a soldier or to provide refresher military training for men who have been in the Army for some time. In either case, the soldier

is trained in those military fundamentals necessary for a member of a service company.

c. Basic technical training. Basic technical training trains the men in the desired military occupational specialty.

d. Basic unit training. In the first stages of unit training, the men should become familiar with the company organization and their place in the unit. As soon as possible, the squads should begin to operate as teams under the direction of the squad leaders. When the squads have developed into operating teams, sections should begin training as units under the section leaders. Platoon operations follow, and, finally, operations of the company as a whole. This progressive training develops the leadership ability of the noncommissioned officers, makes clear the responsibilities of the various echelons of command, and integrates each element of the company into a working unit.

e. Advanced unit training. Advanced unit training may be given when ordered by proper authority.

11. METHODS OF INSTRUCTIONS. **a. General.** Training will be conducted in accordance with the approved methods prescribed in FM 21-5, TM 21-250, and TF 7-295.

b. Training schedule. The company commander (under the direction of the battalion S-3 when the company is part of a battalion) will prepare the training schedules as prescribed by FM 21-5. These schedules will use the mobilization training

program as a guide, and they will make maximum utilization of the local training facilities.

c. References and instructional material. The mobilization training programs contain adequate references to War Department instructional material. However, new material is constantly appearing. To obtain the latest references and training aids, it is necessary to consult the most recent editions of FM 21-6, FM 21-7, and FM 21-8. All Field Manuals, Technical Manuals, and other War Department publications pertinent to the training and operation of the company should be collected in a company library and made available to all interested personnel.

d. Instructor guidance program. Officers, noncommissioned officers, and other instructors should be given appropriate instructor training throughout the entire training period. A cadre school is organized as soon as the unit is activated, preferably before the trainees arrive. As soon as the platoon sergeants, section leaders, and squad leaders are selected, they also attend the school. Here the noncommissioned officers are reviewed in their specialties and are trained in the methods of military instruction, as outlined in FM 21-5 and TM 21-250. In the school, the company commander is able to set up definite chains of responsibility for job supervision. The cadre school continues throughout the training period and gradually evolves into the meetings described in paragraph 14c.

12. SCOPE OF TRAINING. a. General. Because of the wide variety of possible assignments, training of a quartermaster service company must be continuous and thorough. Service companies have been called upon to do each type of work included in the mobilization training programs. To prepare a company for field duty, the entire program must be covered.

b. Field operations. Actual planning for the field operations phase of training is dependent upon the local facilities. However, the purpose of this phase is to permit the company to perform its tactical and logistical function as an operating unit under conditions similar to those which the unit will encounter in the field. Squads, sections, and platoons should operate under their own leaders. Such battle conditions as loss of personnel, supplies, and equipment by enemy action should be simulated. Operations under the maximum load must be conducted night and day. Unit standing operating procedures for all normal unit activities should be prepared and continually rehearsed. The value of unit standing operating procedures cannot be minimized. Specific plans are developed for activities and specific duties are assigned. Examples of unit activities to be incorporated into the unit standing operating procedure are: establishing of a bivouac, march security, demolition, often-called-for work details, and control of labor. Proficiency in the technical operations of the company must be attained. Defensive technique should be stressed.

c. On-the-job training. Service companies can get valuable training by working at posts, depots, or ports. Experience in loading and unloading carriers, sorting and stacking supplies, segregating salvage, and similar activities is valuable in preparing the company for field duty. Work should be done under the direction of the company commissioned and noncommissioned officers with supervision by installation personnel when necessary. To obtain the greatest value for the members of the service company, rotation of work details must be practiced in on-the-job training. On-the-job training can also be of value in job analysis and for the development of work simplification methods.

d. Fundamental points. Efficient operating overseas demands that the service company stress the following points incessantly:

(1) *Bivouac selection and development.* Service companies assigned to communications zones or army service areas may bivouac in the same location for several weeks or months. In such a situation, the semipermanent camp site should be improved by good camp engineering in order to contribute to the comfort, morale, health, and efficiency of a service organization in the field. Proper selection of sites, tent pitching, field installations such as showers, wash racks, box latrines, etc., and good field housekeeping should be included in the training. The armorer-artificer, particularly, should know how to improvise field installations to develop the camp site.

(2) *Field sanitation and personal hygiene.*

During the training period, field sanitation and personal hygiene must be stressed until they become second nature with the men. The health and comfort of the men depend to a large degree upon how well the company is trained in field sanitation and personal hygiene.

(3) *Security.* In areas subject to enemy observation and attack, proper security measures must be taken both in bivouac and on the job. The principles and techniques outlined in paragraph 13 must be thoroughly taught.

(4) *Separate platoon operations.* Platoons should be trained to operate as self-sustaining units. In some situations a platoon may be detached from the company and operate independently for long periods of time.

(5) *Definite lines of responsibility.* Company commanders should carefully build up definite command channels within the company and be sure that the chain of command is followed in job supervision. Work assignments should be made by squads or multiples of squads. Squad leaders must be responsible for their squads, section leaders for their sections, and platoon sergeants for their platoons. Platoon leaders should make their criticisms, comments, and commendations through the noncommissioned personnel. Company commanders should work through the platoon leaders. Strict adherence to the chain of command makes responsibility clear and dignifies the position of the noncommissioned officer.

(6) *Fundamental work techniques.* Service companies do most of their work with quarter-

master supplies, particularly with subsistence and gasoline. Therefore, they must be thoroughly trained in sorting, stacking, loading, unloading, palletizing, and warehousing these supplies. They should be familiar with materials handling equipment — especially gravity conveyors, which are widely used overseas. The company should have knowledge of railhead procedure, and noncommissioned officers should be familiar with the paper work involved in ration break-down and gasoline issues. Continued analysis of work methods must be made so that fundamental work techniques which result in the saving of time and manpower can be developed.

(7) *Development of noncommissioned officers and technicians.* The loss of personnel because of sickness, combat casualties, transfers, and disciplinary action often makes it necessary to appoint new noncommissioned officers and technicians. Other losses of noncommissioned personnel may occur if the company is called upon to provide cadre for units to be activated, or when key men go to officer candidate schools. Therefore, replacements should be in training at all times. For example, men who have a knack for cooking should be made cooks' helpers so that the company mess will not suffer if the cooks should have to be replaced. Men who show evidence of ability for leadership should be groomed for squad leaders as vacancies occur. Before the problem arises, officers should intelligently plan an on-the-job training program.

(8) *Weapons training.* The mobilization train-

ing programs provide for instruction of all personnel in the use of weapons. If possible, each member of the company should qualify with the weapon with which he is armed and should know the use and the firing technique of the other company weapons.

13. SECURITY AND DEFENSE. a. General. The quartermaster service company must be prepared to provide its own security and to defend itself against air, ground, chemical, or mechanized attack. Generally, the company will fit into the defensive plan prescribed by higher headquarters and will supply personnel not only for the security of its own bivouac area but also for the installation which it is serving. Intensive training should be given in the use of patrols, flank and rear guards, and outposts. Unexpected situations in the theater of operations will often confront officers and men. The company, platoons, sections, and squads must be able to act alone if the occasion demands. Every man in the company should understand thoroughly the principles of passive and active defense, the use of weapons, the destruction of supplies and equipment, and the use of camouflage and cover. All normal instructions should be included in the unit standing operating procedures.

b. Interior guard. In the communications zone and sometimes in the rearward sections of the army service area, the service company provides interior guards for supply installations and for their bivouac areas. Personnel of the company

must be thoroughly trained in guard duty as prescribed in FM 26-5. (See par. 31.)

c. March security. Service company personnel are usually moved from one area to another by truck convoy. The vehicles and the defense plan are provided by other units, but members of the company must be familiar with such operations in order to fit into the plan. Entrucking, detrucking, dispersion when attacked, and the other elements of convoy security as set up in FM 25-10 should be studied.

d. Bivouac security. (1) The general bivouac location of the company will be determined by the command to which the company is assigned. After the general area is assigned, the company commander should select the specific location, taking into consideration convenience to the operating area, suitability of the ground, presence of overhead cover to prevent aerial observation, and accessibility to the road net. The area chosen should be well-drained, high ground which is defensible. Adequate space should be available to provide for dispersion.

(2) Bivouac areas must be prepared for all-around defense. The defense plan of the company should provide a duty for each man and the plan should be rehearsed until action of each man is automatic in case of attack. FM 5-20C gives details for camouflage of a bivouac area.

e. Land mines and booby traps. FM 5-31 gives detailed information on the use of land mines and booby traps. Service company troops may use these weapons to strengthen defensive positions.

f. Camouflage. (1) The principal defense of quartermaster installations to which service company personnel may be attached is concealment, either natural or produced by camouflage. FM 5-20, FM 5-20A, FM 5-20B, FM 5-20C, and FM 5-20H give details for proper camouflage procedures.

(2) The value of good camouflage is quickly destroyed by careless camouflage discipline. Company officers and noncommissioned officers must constantly impress upon the troops the fact that the carelessness of one man may give away their position and endanger the whole group.

g. Demolition. Demolition of supplies and equipment is a command responsibility and should be effected only in compliance with higher authority. Demolition of quartermaster supplies and equipment will follow the procedures set up in current War Department publications. Vehicles and other heavy equipment will be destroyed according to the Technical Manuals accompanying the equipment.

CHAPTER 4

OPERATIONS

Section I

CONTROL

14. CONTROL WITHIN COMPANY. a. Relationship of company to higher headquarters. The quartermaster service company is always attached or assigned (either as a separate company or as a part of a battalion) to a higher headquarters to furnish military labor as required. The higher headquarters controls the company and the company conforms to its directives and standing operating procedures. The company commander through his junior officers and noncommissioned officers is responsible for the performance of the work. Close liaison between the service company and the using agency is necessary to prevent misunderstanding and to insure efficient operation.

b. Locator board. A locator board should be improvised for each company headquarters. This board should show the name of each man (including overhead personnel), his squad or his position in the company, and the job he is doing on the particular day. To show the status of each man, a peg or tag can be used. These tags are labeled "KP," "Guard," "Detail 1," "Sk in hosp," etc. This system has a double value—it names a definite man for each job, and it shows who is available for detail. The system is efficient and time-saving.

c. Meetings of key personnel. The company commander should hold regular meetings of his officers and noncommissioned officers. These meetings are an outgrowth of the cadre school started during the training period. The meetings must have a definite business to accomplish. The skillful commander can use them to establish understanding between officers and noncommissioned officers, to hear and settle complaints, to define his chain of command, to get useful suggestions regarding operations, and to instruct in anticipated operations. He should also encourage meetings on platoon and section level when it is necessary to iron out difficulties within these groups.

d. Overhead personnel and personnel available for detail. A recurring problem in a service company is the reduction of company overhead in order to have as many men as possible available for work details. Experience in theaters of operations has proved that from 20 to 30 men are necessary for company overhead (headquarters, mess, malaria control, etc.). Men available for details will be assigned work as they are requested. Company officers should check the details while at work to assure that all men are being efficiently used. If a detail appears too large, liaison with the using activity may effect a reduction in the size of the detail and make some of the men available for other assignment.

15. REQUISITIONING AND SUPPLY OF LABOR. a.

Operating set-ups. The service company may operate as a separate company; it may operate

under direction of battalion headquarters; or it may operate as part of a labor pool under the direction of the labor officer of the installation to which the company is attached. However, the principles of requisitioning and supply of labor are the same whether the dispatching agency is the company headquarters, the battalion headquarters, or the labor officer. Normally, a standing operating procedure is prepared by the operations officers of the organization or installation to which the service units are attached, and using agencies must comply with the control plan.

b. Principles of labor supply. A system of labor control must always be planned to suit a particular situation. However, the following general principles are applicable to all situations:

(1) All requests for labor should be submitted to the highest headquarters concerned.

(2) Permanent details should be provided automatically each day if the troops are available.

(3) Except in emergencies, requests for new details, or changes in strength of permanent details, should be received by the dispatching agency not later than a designated time on the day preceding that for which troops are desired.

(4) Requests for emergency details submitted after the designated time should be addressed to the highest headquarters concerned, which will rule on the emergency status.

(5) At each point where work details are required an officer should be authorized to receive the detail and to release it when the work is completed. He will personally submit requisition for

service troops as he needs them, and work details will be assigned to him specifically.

(6) When work details are to report to a person other than the requisitioning officer, the requisitioning officer will specify the work locations and the person to whom the details will report.

(7) Transportation of work details must be arranged for, since the service company has only enough vehicles for housekeeping. It must also be determined whether the work details will report directly to their work locations or clear through an assembly point.

(8) All complaints regarding the work details should be submitted to the headquarters to which request was made for the detail. If further action is necessary, the matter will be referred to the next higher echelon of command.

(9) Requests for service troops will be screened carefully and held to a minimum consistent with efficient operation.

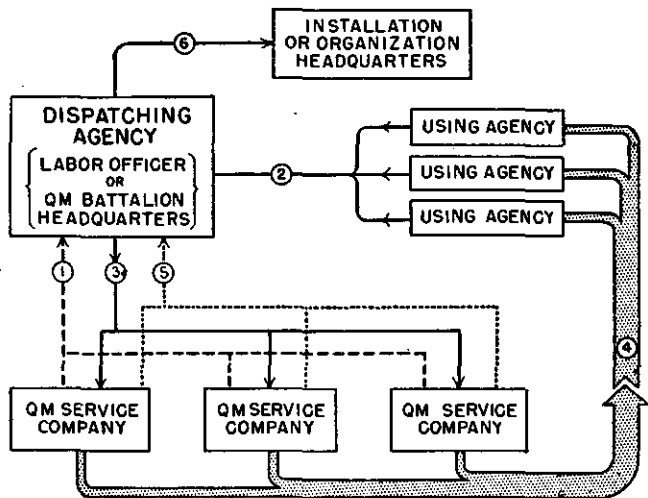
c. Elements of labor supply. Reduced to its minimum, any plan for the requisitioning and supply of labor must include the following elements (see fig. 2) :

(1) The dispatching agency, whether it be a company headquarters, battalion headquarters, or the labor officer in charge of a labor pool, is informed by the units furnishing work details of the number of men available each day.

(2) The dispatching agency receives requests for work details from the using agency in order to apportion the work properly to the available units.

(3) The service company determines the men to compose each detail and assigns the details to the various using agencies as ordered by the dispatching agency.

(4) The dispatching agency is notified by the service company of the details furnished and, in turn, notifies higher headquarters of the utilization of the available labor.



- ① Companies report available labor.
- ② Using agencies request work details as needed.
- ③ Dispatching agency orders companies to furnish work details.
- ④ Companies assign work details as ordered.
- ⑤ Companies report the assigned work details to dispatching agency.
- ⑥ Dispatching agency reports utilization of labor to higher headquarters.

Figure 2. Schematic diagram showing elements in supply of labor. Close liaison between interested headquarters is necessary to achieve maximum utilization of manpower.

d. Suggested forms for control of personnel. There are no prescribed forms for use in the control of service troops. However, a simple system of paper work should be improvised to keep all headquarters concerned informed of the status of the troops. The following system involving the use of six forms has proved practical when the company is functioning as part of a quartermaster battalion. These suggested forms may be modified as required.

(1) *WD AGO Form R-5280 (Daily Report of Labor Available)*. See figure 3. This form is submitted daily by the company to the dispatching agency. It shows the strength of the company, the number of men not available for duty (giving reasons), and the number of men expected to be available for work details the following day. It is delivered to headquarters before noon of the day preceding that for which the labor will be available. On the basis of these reports from the various companies, the dispatching agency learns how many men can be assigned to work details the following day. This form may be reproduced locally. The number and date must appear on each form.

DAILY REPORT OF LABOR AVAILABLE		Date Monday, 29 August 1945	
3220th Quartermaster Service Company			
402nd Quartermaster Battalion			
ESTIMATE OF LABOR AVAILABLE			
	SGT	PVT & PFC	TOTAL
Total strength	33	182	215
Not available	12	30	42
Available	21	152	173
Assigned to permanent details	11	88	99
Available for other details	10	64	74
REASONS FOR NONAVAILABILITY			
	SGT	PVT & PFC	TOTAL
Overhead (Authorized I/O)	11	6	17
Kitchen police		6	6
Malaria control	1	0	1
Furlough		1	1
Absent without leave			
Pass			
Confinement		2	2
Sick in hospital		10	10
Sick in quarters			
TOTAL	12	30	42
Remarks			
Signature of Officer-in-Charge		John H. Jefferson JOHN H. JEFFERSON 1st Lt., Q. M. C.	
NOTE: No service details of any type are to be shown on this form. This report will reach battalion headquarters by 1130 hours each day.			
WD AGO Form R-5280 1 DEC 1945			

Figure 3. WD AGO Form R-5280 (Daily Report of Labor Available). This form is prepared by the company to inform the dispatching agency of the number of men available for work the following day.

(2) *WD AGO Form R-5281 (Request for Work Detail)*. See figure 4. This form is prepared by the using agency and forwarded to the dispatching agency. It states the number of men desired, the type of work to be done, the uniform to be worn, the period of time the detail will be needed, and where, when, and to whom to report. This form should be submitted to the dispatching agency before a designated time on the day before the labor is needed. Verbal requests should not be honored except in emergencies. In case of an emergency, the formal request for work detail should be submitted to confirm the verbal requests. The forms may be reproduced locally. The date and number should appear on each form.

REQUEST FOR WORK DETAIL		Date 26 August 1945
Organization or Unit Class I Supply Officer		
Address Warehouse No. 7		Telephone Ext. 306
TO: Commanding Officer, 402nd Quartermaster Battalion		
REQUEST FOR WORK DETAILS		
Number of Men 4 NCO 24 PYT	Type of Detail <input type="checkbox"/> Permanent <input checked="" type="checkbox"/> Temporary	
If temporary, estimated number of days needed 1		
DETAIL WILL REPORT		
To Whom Capt. McKinnon		
Place Warehouse No. 7		
Hour 0800	Date Monday, 27 August 1945	Uniform to be Worn Fatigues
Nature of Work to be Performed Warehousing		
Remarks		
Signature of Requesting Officer ROBERT A. MCKINNON Capt., QMC		Detail No. 14
NOTE: This form is to be used for new details or for increases to established details. Except in emergencies, it will be completed and submitted to battalion headquarters before 1500 hours of the day preceding that on which the detail is to begin working.		
WD AGO Form R-5281 1 DEC 1945		

Figure 4. WD AGO Form R-5281 (Request for Work Detail). This form is prepared by the using agency for requesting work details from the dispatching agency.

(3) *Detail Breakdown Sheet*. See figure 5. This form is prepared by the dispatching agency. Section I, Battalion Availability Summary, is filled in as the Daily Report of Labor Available (fig. 3) is received from the various companies. When completed, the totals show the number of men the dispatching agency has available; section II, Work Details, is filled in from the previous day's Detail Breakdown Sheet (permanent details are listed first) and from the Request for Work Detail (fig. 4) that is received from the various using agencies. The last column is used to apportion the work to the various companies. The form is primarily a dispatching work sheet, but a copy may also be used as a report to higher headquarters showing the disposition of available labor for the day. This form may be reproduced locally. The number and date must appear on each form.

DETAIL BREAKDOWN SHEET			SECTION I - BATTALION AVAILABILITY SUMMARY			
Date Monday, 27 August 194-			Total strength	Not available	Available	TOTAL
402nd Quartermaster Battalion			Assigned to permanent details	Available for other details		
SECTION II - WORK DETAILS			Yield	Unifera	Company	
Detail	ECO	PM	Place to Report	Person Receiving	Yield	Unifera
1	2	22	Laundry	Cpl. Williams	0800	Patigues
2	3	33	COT Storage Plant	Lt. Blythe	0800	do
3	1	19	12th. Shed	Capt. Jensen	0800	do
4	1	7	W. P. Detachment	Major Girault	3000	Wool, od
5	2	20	Warehouse No. 2	Lt. Ward	1000	Patigues
6	0	3	Headquarters	Major Porter	0800	do
7	0	2	Message Center	Lt. Bailey	0800	Wool, od
8	0	2	Message Center	Lt. Jones	1400	do
9	0	2	Message Center	Lt. Smith	2000	do
10	1	10	Motor Pool 1	Lt. Bloom	0800	Patigues
11	2	19	Motor Pool 1	Lt. Sear	0800	do
12	5	44	Engineer (Utilities)	Lt. Meany	0800	do
13	0	22	Engineer Supply O.	Lt. Mitchell	0800	do
14	11	88	Quartermaster Sup. O.	Capt. Kiefer	1000	do
15	4	24	Warehouse No. 7	Lt. Piatt	0800	do
16	2	22	Post Exchange O.	Capt. McKinnon	0800	do
17	2	22	Post Exchange O.	Lt. Kojowski	0800	do
TOTAL			47	418	(Carried Forward)	
WD AGO Form R-5282			1 DEC 1945			

Figure 5. WD AGO Form R-5282 (Detail Breakdown Sheet). This form is a work sheet prepared by the dispatching agency. Additional sheets are used as needed. The last column is used to note the company which is ordered to furnish the detail.

(4) *WD AGO Form R-5283 (Work Assignment Sheet)*. See figure 6. This form is prepared by the dispatching agency and forwarded to the appropriate company commander. It lists the details the company is to furnish, the strength of each detail, the uniform to be worn, and where, when, and to whom to report. This form must reach company headquarters in time for the company to prepare and publish the rosters of the work details. The form may be reproduced locally. The number and date must appear on each form.

WORK ASSIGNMENT SHEET			Detail Assigned To		Date	
			3220th Quartermaster Service Company		Monday, 27 August 1946	
SECTION I - PERMANENT DETAILS						
Detail	SGO	PVT	Place to Report	Person Receiving	Time	Uniform
14	11	88	Quartermaster Supply Co	Capt. Kiefer	0800	Fatigue
TOTAL	11	88				
SECTION II - OTHER DETAILS						
Detail	SGO	PVT	Place to Report	Person Receiving	Time	Uniform
16	4	24	Warehouse No. 7	Capt. McKinnon	0800	Fatigue
17	3	22	Post Exchange Office	Lt. Kolowatz	0800	do
18	3	16	Pine Marshal	Lt. Larson	0800	do
TOTAL	9	62				
SECTION III - SUMMARY						
Total		SGO	PVT	Total	SGO	PVT
Permanent detail		11	88	Reported available	21	152
Other detail		9	62	Assigned	20	100
Total Assigned - All Details		20	150	Reserve unassigned	1	2
By Order Of:		Lt. Col. John O. Haren		Signature of Adjutant		
				<i>Robert A. Fausch</i> ROBERT A. FAUSCH Capt., GFC Adjutant		

WD AGO Form R-5283
1 DEC 1945

Figure 6. WD AGO Form R-5283 (Work Assignment Sheet). This form is prepared by the dispatching agency as a directive to the company to furnish the work details listed.

(5) *WD AGO Form R-5284 (Report of Work Detail)*. See figure 7. This form is prepared by the company for each detail and given to the noncommissioned officer in charge of the detail. The form shows the strength of the detail, the person in charge, and where, when, and to whom the detail is to report. The report is signed by the person authorized to receive the detail and by the noncommissioned officer in charge of the detail. The form is then returned to company headquarters and filed as a record of work performed. The form may be reproduced locally. Number and date of form must appear.

REPORT OF WORK DETAIL		Detail No. 10
<u>3220th</u> Quartermaster Service Company <u>402nd</u> Quartermaster Battalion		Date Monday, 27 August 194-
WORK DETAIL REQUESTED		
Number of Men 4 NCO 24 PVTS	NCO Officer in Charge (Name & Grade) Ralph S. Caughman, S/Sgt.	
WORK DETAIL REPORTED		
Number of Men 4 NCO 24 PVTS	Reported to (Name of Requesting Officer) Capt. McKinnon	
Time Reported 0800	Place Warehouse No. 7	
Signed By (NCO in Charge) <i>Ralph S. Caughman</i> S/Sgt. Ralph S. Caughman	Confirmed By (Requesting or Authorized Receiving Officer) <i>Robert A. McKinnon</i> Robert A. McKinnon, Capt., QMC	
Time Detail Released 1630	Signature of Officer Releasing Detail <i>Robert A. McKinnon</i> ROBERT A. MCKINNON Capt., QMC	
WD AGO Form R-5284 1 DEC 1945 R-5284		

Figure 7. WD AGO Form R-5284 (Report of Work Detail). This form is prepared by the company for each work detail furnished.

(6) *WD AGO Form R-5285 (Company Adjustment Sheet)*. See figure 8. This form is prepared by the company and forwarded to the dispatching agency after the work details for the day have left the company area. This sheet shows the number of men reported available, the number the company was ordered to furnish, the actual number furnished, the difference between the number ordered and the number furnished, and an explanation of any differences. The sick-call record of the day before is also reported. The form may be reproduced locally. Number and date of form must appear.

COMPANY ADJUSTMENT SHEET				Date Monday, 27 August 1945	
3220th		Quartermaster Service Company 402nd		Quartermaster Battalion	
SUMMARY OF DIFFERENCES IN TOTAL ORDERED & TOTAL FURNISHED					
Estimated & Actual Strength Furnished	NCO			PVT & PFC	Total
Total reported available	21			162	173
Total ordered to be furnished	20			150	170
Actual number furnished	20			149	169
Balance	0			-1	-1
EXPLANATION OF SHORTAGES					
Detail	NCO	PVT & PFC	Person Receiving	Reason	
14	0	1	Capt. Kiefer	Sick call	
Total	1				
SICK CALL REPORT					
Date	NCO			PVT & PFC	Total
Number reported	0			5	5
Number marked "Duty"	0			3	3
Balance	0			2	2
Officer in Charge (Signature)			John H. Jefferson		
			JOHN H. JEFFERSON		
			1st Lt., Q. M. C.		
NOTE: This report must reach battalion headquarters by 0800 hours daily.					
WD AGO Form R-5285					
1 DEC 1945					

Figure 8. WD AGO Form R-5285 (Company Adjustment Sheet). This form is prepared by the company to report details furnished and to correct discrepancies between estimated and actual strength.

Section II

TYPES OF OPERATIONS

16. IN ZONE OF INTERIOR. The quartermaster service company has no normal operations in the zone of the interior. However, companies may be attached to posts, camps, stations, depots, ports, or tactical units for relief of labor shortages and for on-the-job training. Such assignments are generally a preparation for service in the theater of operations.

17. IN THEATER OF OPERATIONS. The quartermaster service company may work with the following units:

a. Ports of debarkation. At ports of debarkation, service companies may be assigned directly to the port or may be attached to a quartermaster base depot supply and sales company, T/O & E 10-387, which provides quartermaster service to the port. When so attached, the service company may perform any of the following duties:

- (1) Sorting and stacking supplies.
- (2) Loading supplies for removal from the dock area.
- (3) Working in holds of ships.
- (4) Providing station services for the port.
- (5) Guarding dock supplies, ships holds, and pipe lines.
- (6) Searching civilians or POW, stevedores, and dock workers when going on and off duty.
- (7) Guarding supply trains and trucks en-route.

- (8) Supervising POW or civilian labor.
- (9) Checking supplies on and off ships to trucks and rail cars.
- (10) Packing, crating and marking.
- (11) Constructing pallets.

b. General or branch base depots. When assigned to base depots, the service company operates under the control of the quartermaster base depot supply and sales company, T/O & E 10-387, or its equivalent. It may perform any of the following duties:

- (1) Unloading and loading railway cars and motor vehicles.
- (2) Sorting, stacking, stowing, and moving supplies.
- (3) Assisting in the operation of mechanical materials handling equipment.
- (4) Handling salvaged material.
- (5) Icing refrigerator cars.
- (6) Performing other required work details.

c. Fixed salvage installations. These installations are generally set up in the base section of a communications zone to receive salvage from salvage collecting companies and partially processed salvage from salvage repair battalions. When working for these fixed salvage installations, service company personnel may perform any of the following duties:

- (1) Receiving, classifying, and distributing to the various repair branches all quartermaster clothing and equipment received at the salvage depot.

(2) Routing laundered or sterilized articles to the appropriate repair personnel.

(3) Assisting in the repair of clothing and equipment.

(4) Sorting and storing salvaged material.

(5) Loading and unloading carriers.

(6) Performing housekeeping duties for the depot.

(7) Performing any other required work details.

d. Railhead companies. When additional labor is required in operating railheads, service company personnel may be called upon to perform the following duties:

(1) Unloading railway cars and trucks.

(2) Sorting and stacking supplies.

(3) Assisting in the break-down of rations.

(4) Performing housekeeping duties in the railhead area.

e. Graves registration companies. Service companies are often called upon to supplement the personnel of the Graves Registration Service. When working with these units, their duties include—

(1) Collecting bodies.

(2) Digging graves and burying the dead.

(3) Erecting grave markers.

(4) Landscaping cemeteries.

f. Depot companies, supply. When working with depot companies, service company personnel may be called upon to perform any of the following duties:

(1) Unloading and loading railway cars and motor vehicles.

(2) Sorting and stacking supplies.

(3) Assisting in eliminating fire hazards.

(4) Performing housekeeping details for the depot.

g. Salvage collecting companies. Under the supervision of salvage collecting company personnel, service company troops may be called upon to perform the following duties:

(1) Recovering salvaged articles.

(2) Sorting clothing and equipment.

(3) Eliminating fire hazards and fighting fires.

h. Gasoline supply companies. When working with gasoline supply companies, service company troops may be called upon to perform any of the following duties:

(1) Assisting in setting up equipment.

(2) Handling empty and filled 5-gallon and 55-gallon drums.

(3) Digging fire trenches.

(4) Performing housekeeping duties at the supply point.

(5) Performing other required work details.

i. Quartermaster semimobile installations. Service companies may be used to supplement personnel of laundry companies, salvage repair companies, and sterilization or fumigation and bath companies when these companies are working together or separately. When working with these semimobile units, service company troops may perform any of the following duties:

(1) Receiving, sorting, classifying, and distributing the salvage received.

(2) Unloading salvage material from carriers.

(3) Packaging repaired articles.

(4) Assisting, when necessary, in operating the equipment.

Section III

FUNCTIONAL DUTIES

18. LIFTING AND CARRYING. **a. General.** Handling supplies is a large part of the work of a quartermaster service company. To prevent strained backs, hernia, and accidents, all personnel must know the correct methods of lifting and carrying supplies. Correct lifting and carrying methods will also lessen job fatigue and increase the efficiency of operations.

b. The lifting position. The ideal lifting position is a sensible posture which leaves no strains or twists in the body (see fig. 9). The best lifting position is described as follows:

(1) The *feet* are 8 to 12 inches apart and quite close to the object being lifted, giving a firm foundation, a good balance, low center of gravity, and sure footing.

(2) The *body* is bent at the knees and hips so that the short, heavy leg muscles do the work.

(3) The *back* is straight, as nearly vertical as possible, so that there is no strain on the long, flat abdominal and back muscles.

(4) The *chest* is held well out.

(5) The *shoulders* are squared.

(6) The *head* is back.

(7) The *arms* are straight.

(8) The *hands* have a good grip. The hands may be protected with gloves.



Figure 9. The ideal lifting position. The feet are well apart, the shoulders are squared, and the back and arms are straight.

c. Principles of correct lifting and carrying. Adherence to the following principles will enable the worker to do lifting and carrying jobs more safely and easily.

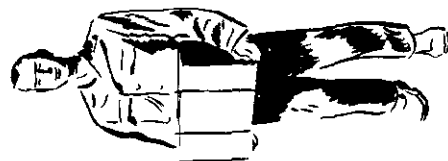
(1) The best lifting position (see b above) should always be used.

(2) No man should try to lift loads beyond his strength. If the load is too heavy, he should get help.

(3) Hands must be free of oil or grease.

(4) To provide good footing, work areas should be firm, free of debris, and clear of water, oil, or any substance which may cause a worker to slip or fall.

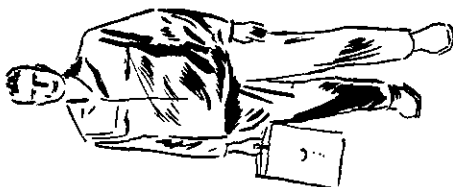
(5) Lifting should be done by pushing up with the leg muscles. This takes the strain off the back muscles.



TRAY CARRY--
FOR SHORT DISTANCES



SIDE UNDER ARM
FOR SHORT DISTANCES



SIDE HAND --
FOR LONGER DISTANCES



SHOULDER ...
FOR LONGER DISTANCES.
NECK SHOULD BE PROTECTED
FROM SLIVERS, NAILS,
AND ROUGH EDGES.

Figure 10. Four methods of carrying. The load must be as close to the body as possible and should not interfere too much with the normal gait.

(6) The lift should be gradual, steady, and without jerking motions.

(7) By shifting the position of his feet, the worker should avoid twisting motions.

(8) The load must be carried as close to the body as possible. It should not interfere with the normal walking gait. The method of carrying depends upon the distance the object is to be carried (see fig. 10).

(9) When carrying a load, the worker should have unobstructed vision ahead.

(10) Packages are put down gently by reversing the lifting process. Smooth and easy handling lessens the strain on muscles and reduces damage to supplies and equipment.

19. LOADING AND UNLOADING TRUCKS. a. General principles of vehicle loading. Loading techniques are developed in accordance with the following general rules:

(1) Heavy supplies should be placed at the bottom of the load and evenly distributed over the bed of the truck.

(2) The cargo should be carefully built up so as to avoid shifting.

(3) The center of gravity of the load should be kept low. If the load is too high, it may cause swaying and make the vehicle hard to drive.

(4) If the load extends above the top of the vehicle body, it should be securely lashed to the truck. Detailed instructions for lashing are found in TM 21-305.

(5) Loads must not extend over the sides or

beyond the tail of the truck unless the load can be carried in no other way. If a load must extend more than 2 or 3 feet beyond the rear of the truck, it should be marked by a red flag in daytime and a red light at night.

(6) Trucks must not be loaded beyond the maximum pay loads noted on the plates on the instrument panel, except when authorized. If the weight of the load is not known, it can be estimated with reasonable accuracy by noting the position of the rear springs.

b. Loading special items. Certain items because of their shape or nature require special handling during loading. These special items include:

(1) *Ammunition* must be handled with care (see par. 29). Overloading must be carefully avoided (see app. IV). No smoking is permitted in the area.

(2) *Baled goods* should be loaded on the bed of the truck, large and heavy bales being placed on the bottom.

(3) *Barrels with heads or empty* are loaded on their sides with the stack pyramided.

(4) *Barrels without heads or covered with burlap* should be stood upright on their solid ends.

(5) *Sacked goods* should be "tied together" by crossing the sacks of alternate tiers in the load.

c. Planning use of manpower. Proper assignment of work details depends upon efficient utilization of available manpower. When assigning men of a work detail to particular jobs, the following data are valuable for planning purposes:

(1) Under normal conditions, capacity of a

work detail can be figured on the average of $\frac{1}{2}$ ton per man per hour for 10 hours each day.

(2) A truck can normally be loaded or unloaded in 20 minutes, regardless of tonnage, if sufficient labor is available.

(3) When packages weighing up to about 60 pounds are being loaded or unloaded at the back of a truck, only two men can work on the truck at one time without getting in each other's way.

(4) When loading or unloading over the side of a truck, three men can be used on the truck.

(5) The number of men to be used on the ground depends upon the distance the packages have to be carried. Usually at least one man on the ground for each man on the truck is necessary to pass the packages along. Other men may be used to form loading lines as discussed in d below.

(6) It is the duty of the officer or noncommissioned officer to check the work of the detail to see that the men are properly placed to accomplish the work efficiently and rapidly.

d. Loading and unloading lines. The chain or "bucket brigade" method should be used whenever possible. Walking back and forth with packages takes time and energy. If the packages are of such size and weight that they may be passed from man to man (such as rations and canned gasoline), a line of men passing the packages can handle a higher tonnage in a given time with less fatigue than is possible by any other man-handling methods. The number of lines to be used depends upon the number of men available.

e. Transferring loads between boxcars and trucks.

When moving supplies between freight cars and trucks, the following practices will save time and labor:

(1) When possible, the supplies should move directly between the freight car and the truck without being placed on the ground or a platform.

(2) Trucks should be backed in almost flush with the side of the car if the terrain permits. The tail gate should be lowered to serve as a car plate between the car and the truck. If a loading platform is between the car and the truck, the truck should be as close to the platform as possible so that the supplies can be moved across the platform without being lowered to the ground.

(3) If trucks cannot be backed to the car or a platform alongside the car, the ground between the car and the truck must be reasonably level and must afford a good footing.

(4) Stooping to pick up packages wastes time and energy. If trucks cannot be backed to the car, the man in the freight car should place the package (weight and shape permitting) on the shoulder of the man on the ground. The man on the truck should lift the package from the shoulder of the man on the ground.

20. LOADING AND UNLOADING RAILROAD CARS. a.

General principles. The techniques of loading and unloading freight cars are essentially the same as for loading trucks except that loads must be blocked and braced to prevent damage to shipment. Normally, the loading will be supervised

by specially trained personnel who will direct the blocking and bracing. (See app. I for car capacities.)

b. Planning use of manpower. While the available equipment and the terrain will affect the operation, in planning the loading and unloading of freight cars the following suggestions are generally applicable:

(1) The maximum number of men that can usually be employed advantageously in loading or unloading one freight car is 11 (1 foreman and 10 laborers).

(2) Two men can work in each car door. As the unloading or loading progresses, the two ends of the car may be worked either simultaneously or one end at a time.

(3) If hand trucks are used to handle packages weighing up to 60 pounds each, not over six men can work effectively. Two men load trucks, two men push the trucks, and two men unload the trucks. Each of the men pushing the trucks handles three trucks—the truck being loaded, the one being unloaded, and the one on the way to or from the car.

(4) When the supplies are loaded and unloaded by hand, the handling methods described in paragraph 19 are used.

21. LOADING VEHICLES ON RAILROAD CARS. Normally, details from the service company will work under the supervision of technically qualified personnel when loading vehicles on flatcars. When in emergencies supervisory personnel may not be

available, the detailed procedure prescribed in the appropriate vehicle Technical Manuals should be followed, since the technique varies for each type of vehicle.

22. USE OF MATERIALS HANDLING EQUIPMENT. a.

Motor-driven equipment. In many situations, service company personnel will work at installations that use motor-driven materials handling equipment, such as fork lift trucks, tractor-trailer trains, straddle trucks, and cranes. This equipment is operated by specially trained personnel and the service company troops will do such work as loading pallets (see par. 24d) and slings, transferring supplies from pallets to carriers, and stacking supplies (see par. 24c).

b. Conveyors. In theaters of operations, gravity conveyors are widely used to move supplies from trucks to stacks, to unload freight cars, to sort supplies (see par. 23), and to move supplies within storage areas. The following information is valuable:

(1) Gravity roller conveyors transport packages over a series of rollers 12 or 18 inches long and $1\frac{3}{4}$ or $2\frac{1}{2}$ inches in diameter. Roller conveyors are issued in straight sections 10 feet long and in 90° curved sections.

(2) Work crews should learn to set up conveyor lines quickly, easily, and rigidly. Standard supporting frames are helpful but not necessary. When standard frames are not available, the conveyor line may be set on piles of solid wooden boxes, such as cases of canned goods.

(3) Gravity-wheel conveyors (sometimes called "skate-wheel") are lighter and faster than roller conveyors but are not so sturdy. The conveyor has wheels on axle rods in place of rollers. Sections are $12\frac{1}{2}$ inches wide by 10 feet long, curved and straight.

(4) On long conveyor lines, it may not be possible to set up the sections so that the packages move by gravity. In such cases, men must be placed along the line to push the packages along.

(5) In unloading freight cars, conveyor sections may be placed in the car as soon as the central space between the doors is cleared. The supplies then move out on the conveyor line. If pallets are being used, sections of conveyor may be placed flat on the floor and the loaded pallet pushed along to the car door for removal by fork lift truck. Inverted sections of skate-wheel conveyor may be used as a dolly for loaded pallets in the same manner.

c. Hand trucks. The hand truck is a commonly used item of materials handling equipment in theaters of operations. It is very valuable for shifting big, awkward containers quickly and safely. A well-trained work detail with hand trucks can move large tonnages rapidly. Two-wheel hand trucks have capacities up to 600 pounds; four-wheel hand-trucks up to 6,000 pounds. The following information is helpful in the use of this equipment:

(1) When pushing hand trucks, the workman should stand erect and lean into the load (see fig.

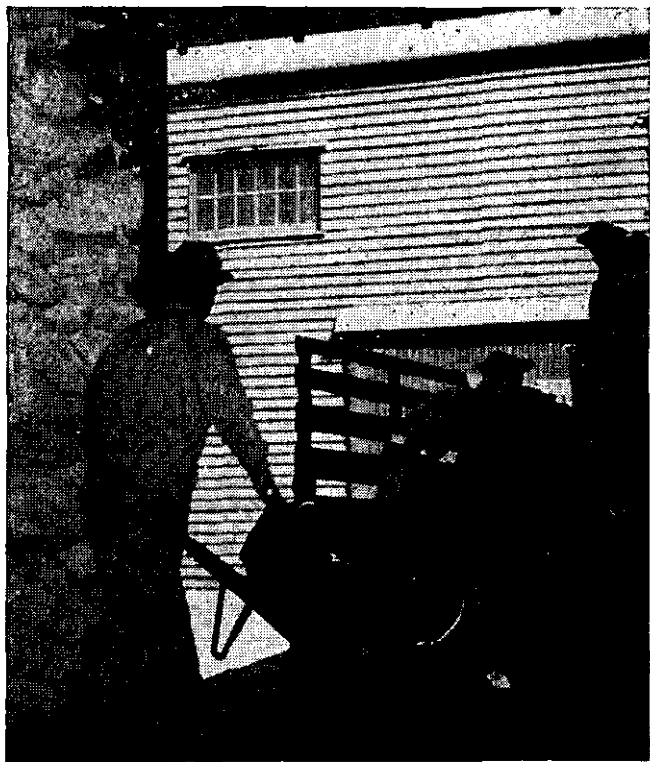


Figure 11. A good position with the hand truck. The workman stands erect and leans slightly into the load.

11). A strained, stooping position is unnecessary and tiring.

(2) When bulky supplies are being handled with a two-wheel truck, an extension may be improvised on the nose of the truck to increase the carrying capacity.

(3) When specialized items are being handled with a four-wheel hand truck, the truck may be equipped with stakes, boxes, shelves, or special racks.

(4) When bagged goods are being loaded on hand trucks, the bags should be stacked flat side down. The nose of the two-wheel truck should not be jabbed under stacks of paper bags because the packages may be damaged.

d. Improvised materials handling equipment. When standard materials handling equipment is not available, improvised equipment often may serve as a satisfactory substitute. The following improvisations have proved practical in theaters of operations:

(1) When bulky items are being unloaded from freight cars or trucks, heavy timbers or logs may be leaned against the carrier to provide a base for rollers. Sections of pipe placed on the runners make excellent rollers.

(2) Cylindrical items such as drums may be loaded or unloaded from carriers by the use of runners and a length of rope. Heavy timbers or logs are dug in the ground and inclined against the carrier and the supplies are raised or lowered by means of a rope.

(3) An improvised skid may be used to lower bulky or heavy packages from trucks to the ground. The package should be eased onto the skid and its speed carefully checked until it reaches the ground.

(4) Unserviceable vehicle tires may be used to break the fall of oil drums and similar heavy ob-

jects dropped from a truck. Several tires should be used so that the item can bounce from one tire to another.

(5) Chutes and slides may be built for use when supplies are being moved from a higher level to a lower. They are frequently used when railroad cars must be unloaded from embankments. When heavy material is being unloaded, a ramp may be used to support the chute.

23. SORTING SUPPLIES. a. General. A large part of the work done by service troops involves sorting and segregating supplies. In beachhead and port operations supplies may have to be sorted by service, by commodity group, and by item.

b. Service color markings. Sorting is expedited by marking packages with the color assigned to the technical service which supplies a given item. Unless otherwise noted below, containers will be painted with triangles of the assigned color on diagonally opposite corners. The various services with their assigned color markings are as follows:

- (1) Chemical Warfare Service—dark blue.
- (2) Corps of Engineers—red.
- (3) Ordnance Department—yellow.
- (4) Quartermaster Corps—generally, green; for sales items, a black stripe is placed along the bases of the green triangle; for subsistence items, a black or green crescent without service color markings is used.
- (5) Medical Corps—deep maroon.
- (6) Transportation Corps—antiaircraft grey.

(7) Signal Corps—a single 2-inch orange band around the small perimeter of the container, parallel to the end and located so as not to interfere with other markings. A small blue line is painted across each end of the container.

(8) Army Air Forces—a single 2-inch light-blue band around the small perimeter of the container, parallel to the end and located so as not to interfere with other markings. A small blue line is painted across each end of the container.

(9) Army Exchange Service—black “x” on diagonally opposite corners.

(10) Special Service Division—white triangles with 2-inch black dot on each triangle.

c. Methods of sorting. The method to be used in sorting mixed loads depends upon the quantity of supplies, the permanence of the installation, and the tactical situation. However, one of the following methods or a modification of one of them will fit almost any situation:

(1) When several trucks are loading from a pile of mixed supplies, each truck will load a particular type of item. The man at the pile end of a loading line will pick up only the item being loaded on his truck. This is the simplest type of sorting, but it tends to tie up trucks if the supplies are not evenly mixed.

(2) A second method of sorting is to have workers on a mixed pile form lines to segregate the supplies into stacks. Trucks then pull up to the stacks and load the already sorted supplies. This system requires more space and more manpower because of the double handling of the supplies, but

it does not tie up the trucks because loads are waiting for them when they arrive.

(3) If roller conveyors are available, several sections are set up and the supplies are moved down the conveyor. Men are placed at stations along the conveyor to remove particular items and to place them on branch conveyor lines, stacks, or pallets. In permanent and semi-permanent set-ups, this method may be developed to expedite the movement of mixed loads to and from rations dumps, depots, and similar supply points.

24. STACKING AND STOWING SUPPLIES. a. General.

After supplies are unloaded and sorted, they are usually stacked in warehouses or open storage areas for storage until needed. Since service company troops do a great deal of stacking and stowing of supplies in theaters of operations, they must be able to do this work rapidly and efficiently.

b. Dunnage. Dunnage is material—boards, logs, etc.—laid on the ground or floor beneath containers, or placed between the layers of a pile. Dunnage stabilizes the stack, keeps the supplies off the damp ground or floor, and provides ventilation for the stack. Dunnage is more important in open storage than in closed storage. Not only does it keep the bottom of the package off the wet ground but in winter it prevents supplies from freezing to the ground. The surface and the climate determine the size of the dunnage. If the ground is soft, a foundation of wide boards, coral, logs, or other material may be necessary before

the dunnage is placed. In warehouses, dunnage 4 inches thick is usually used. Open-storage areas that are well drained require dunnage 6 inches thick.

c. Hand stacking. Most of the supplies in theaters of operations are hand stacked, and much of this work is done by quartermaster service companies. The following rules must be observed in the hand stacking of supplies:

(1) The "bucket brigade" system (see par. 19d) is the best way of moving the supplies from the unloading point to the stacking point.

(2) If space permits and the storage area is in danger of attack by enemy aircraft, outdoor stacks should be limited to 6 feet in height to prevent telltale shadows and to make camouflage easy. If this precaution is impossible or unnecessary, stacks should be no more than 20 to 30 feet high. Higher stacks make stable stacking difficult and tend to crush the packages in the lower tiers.

(3) When supplies are being stacked in warehouses, the load capacity of the floor must not be exceeded.

(4) Packages must be placed on the stack in such a position that the markings can be read from the ground or floor.

(5) To keep stacks solid, upstanding, and safe, tiers are bound together by stacking containers on one tier lengthwise and on the next tier crosswise. The repaired amount of cross stacking varies with the supplies. Cross tying should be limited to individual small stacks within a large block so as to permit the proper rotation of supplies.

(6) When practicable, all stacks containing the same item should contain the same number of items. This unit block facilitates inventory and stock control.

(7) When building up a block by hand stacking, the "step" system should be used, the block being built up from the rear of the stack toward the aisle. Before the stack reaches a height to which it is difficult to pass the packages, a step is left at the side for the convenience of the workmen. As the stack grows higher, other steps are left. When the planned height is reached, the steps are filled in to form a solid block.

(8) To insure stable and neat blocks, the stack should be carefully aligned both vertically and horizontally.

d. Palletizing supplies. When fork lift trucks are being used, work details will be called upon to stack supplies on pallets. When supplies are stacked on pallets, two things must be remembered—the palletload must be stable, and the top of the palletload must be as level as possible so that it can support other palletloads placed on top of it. When loading pallets, use the following method:

(1) Place the first tier using a pattern that will cover the entire pallet surface (with an overhang of 3 inches or less). If the pattern used does not cover the pallet, try another pattern. If no pattern can be found by which all space on the pallet is taken up, a pallet of a different size should be used.

(2) Cross stack a second tier to insure against shifting or toppling.

(3) Place additional tiers required to load the pallet to the volume or weight capacity of the fork lift truck, cross stacking to assure stability (see fig. 12).

(4) After the first pallet has been worked out, standardize the stacking pattern so that operating speed can increase as the men become familiar with the pattern.

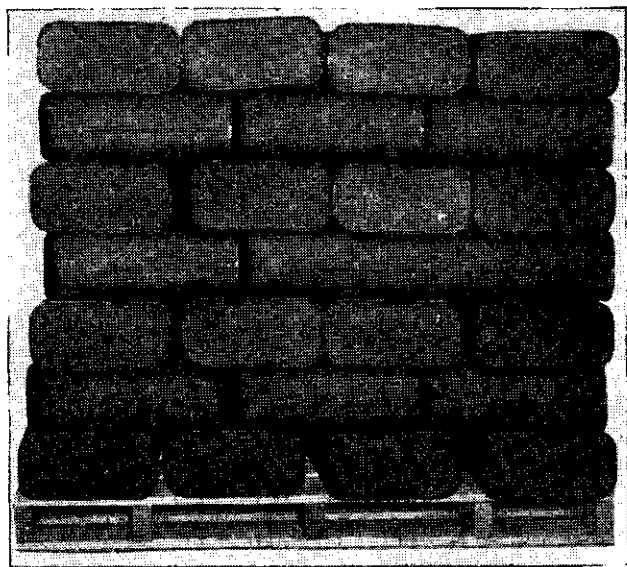


Figure 12. Pallet loaded with empty 5-gallon gasoline drums. Cross stacking makes the load stable. Notice that the load covers the entire top surface of the pallet.

25. WAREHOUSING OPERATIONS. Warehousing operations engaged in by service company troops will normally consist of unloading, loading, sorting, and stacking supplies under the supervision of technically trained personnel as described in previous paragraphs. If it should be necessary to engage in extensive warehousing operations, FM 10-22 and TM 10-250 should be consulted for detailed technical information.

26. HANDLING SUBSISTENCE. a. Stacking subsistence.

Proper stacking methods for subsistence not only prevent damage to items while in storage but also insure speed and efficiency of handling. Most subsistence items are packed in light (60-pound or less) packages that are easily handled. The containers vary widely in type, including fiber cartons, wooden boxes, cans, drums, barrels, and bags. The method of stacking that is most convenient for each item must be used. The method used depends largely upon the ceiling height of warehouses, the nature of the container, the nature of the commodity, and the bursting point of the bottom layer. However, the following suggestions are helpful when handling subsistence:

- (1) When lifting cardboard containers, grasp the carton underneath in a manner that will not tear or strain the package.

- (2) Do not drop containers on a stack. Ease them gently into place.

- (3) Cross pile subsistence items in cardboard packages.

(4) Do not stack cartons too high. The weight of the product and the strength of the package will determine the height to which subsistence items packed in cardboard should be stacked.

(5) Do not use hooks on cardboard containers.

(6) Loose nails and broken tops or sides of wooden cases can ruin the stack. Send such cases to the packing section to be recased or to the loose-issue section for immediate issue.

(7) Wear gloves when handling wooden cases. Nails, wire strapping, clamps, and splinters can cause serious injuries.

(8) If a sack is torn, repair the hole before lifting the sack.

(9) Do not drop sacks on piles. It often breaks the seams.

(10) Exercise special care in the handling of items which can be bruised, such as potatoes and onions.

b. Break-down of rations. If work details from the service company are called upon to assist in the break-down of rations, the procedures described in TM 10-379 should be followed.

27. HANDLING CLOTHING, EQUIPMENT, AND GENERAL SUPPLIES. The methods of handling clothing, equipment, and general supplies are essentially the same as for handling subsistence. The techniques must be modified to allow for the differences in the bulk and weight of the packages and in the nature of the products. (See FM 10-22 and TM 10-250 for details in handling these items.)

28. HANDLING GASOLINE AND OIL. **a. Sources of detailed information.** When service company personnel work for any length of time at gasoline supply points, they should become familiar with the detailed information given in TM 10-465. AR 850-20 gives safety precautions.

b. General handling precautions. The following general rules will be helpful when handling class III supplies:

(1) Lubricating oils are packed in 5-gallon and 55-gallon steel containers. Gear lubricants are packed in 5-, 15-, and 55-gallon drums. Greases are packed in 1-pound, 5-pound, and 25-pound pails, and 100-pound and 400-pound drums. The large containers, which are not covered by shipping cases, should be stored on their sides in order to prevent water and dirt from collecting on the heads and thus contaminating the contents. The smaller containers are packaged in fiber, cardboard or wooden cases and they should be stored as described below.

(2) Strips of lumber should be placed under the heads or rings of drums.

(3) All stones or other objects which may puncture the drums should be removed from storage areas.

(4) Drums should be covered with metal or canvas to protect them from the weather.

(5) Lubricating oils and other lubricants packed in cardboard or wooden cases should be stacked on dunnage on dry, level ground and kept covered until issued.

(6) When it is necessary to insert faucets or pumps in drums of oil or grease for bulk issue, the area around the opening of the drum should be wiped clean. The faucet or pump should also be wiped clean and dry before being inserted into the drum.

(7) All funnels and other dispensing equipment should be wiped clean and dry before and after use so that dirt and water may be prevented from coming into contact with the oil or grease.

(8) All cans in a case should be used before another case is opened.

(9) Packages should not be dropped or handled roughly.

(10) Lubricants in cans which develop leaks should be used immediately or transferred to containers of the same commodity.

(11) Containers should not be thrown on top of each other or thrown off vehicles to the ground. Such action, causing the containers to develop leaks, wastes gasoline and creates fire hazards (see par. 22d(4)).

(12) Handling gasoline requires arduous work in bending, lifting, carrying, loading, and unloading. Roller conveyors, skids, or hand trucks should be used whenever possible.

(13) In an open-storage area that is subject to attack, class III supplies should be dispersed widely.

c. Safety precautions. Many casualties have occurred and valuable fuel and lubricants have been lost because proper safety precautions were not observed. The following safety measures must

be rigidly enforced at all times and places where gasoline and oil are handled:

(1) No fires will be built or matches lighted in the vicinity of gasoline operations. Smoking is prohibited at all times.

(2) Containers, whether filled or empty, must be kept closed at all times. The vapor from 1 pint of gasoline in an open container gives off 250 cubic feet of explosive mixture at an ordinary temperature.

(3) A can should never be filled while on a truck. It should be placed on the ground so that static electricity generated by the flow of gasoline through the hose will be grounded. Otherwise, the fuel may ignite and explode.

(4) All flashlights except the vaporproof types should be kept away from cans. Battery sparks can easily ignite gasoline vapor.

(5) Leaks must not be neglected. General inspection for oil and gasoline leaks should be made frequently. Leaking containers must never be transported. All gasoline leakage must be covered immediately by loose earth to retard evaporation.

(6) Dripping gasoline must not be allowed to form a pool. A chance short circuit or sparks from an engine, muffler, exhaust, or a man's shoes may ignite the fumes.

(7) Striking the hose nozzle against cans or striking the cans together should be avoided. Nonsparking tools only should be used for the purpose of unloading tank cars.

(8) Waste and oily rags must not be allowed

to collect. This material can cause spontaneous combustion.

(9) Nozzles should be placed in contact with the edge of the opening when cans are being filled. Contact should not be broken until the can is filled and the flow of gasoline has stopped. Constant contact allows static electricity generated by the flowing of the gasoline to pass through the metal nozzle and can into the ground.

(10) A fine gauze should be used in the filling funnel when gasoline must be filtered. Gasoline must not be filtered through a chamois skin unless absolutely necessary, and never under pressure. If gasoline must be strained through a chamois skin, the funnel holding the chamois should be grounded to the container into which the gasoline is being poured. The funnel should never be supported by wood or other insulating material.

(11) Water containers and gasoline containers should be segregated.

(12) Leaded gasoline should never be used for cleaning purposes. Such gasoline coming in contact with the skin can cause lead poisoning.

(13) All personnel handling gasoline must wear shoes free from metal plates or protruding nails. Shoes should be treated with dubbin to make them gasolineproof.

29. HANDLING AMMUNITION. a. General. Service company troops may be called upon to load and unload ammunition in ships' holds, dumps, depots, and magazines. Ordinarily, skilled personnel will direct the work. Should a technically

trained supervisor not be available, detailed information can be found in TM 9-1900 and TM 9-1990. In general, handling ammunition is similar to handling other supplies except that additional safety precautions must be followed because of the nature of the commodity.

b. Loading and unloading ammunition. When handling ammunition, the following rules should be observed:

(1) All ammunition will be stacked in a manner permitting ready inspection and quick removal in case of fire.

(2) All ammunition will be handled carefully.

(3) When stored outside, ammunition will be covered with a tarpaulin to protect it from direct sunrays and rainfall. Piles will be arranged to permit free circulation of air.

(4) No nails or tacks will be driven into any container of explosives or ammunition.

(5) Loose rounds will not be kept around ammunition storage dumps.

(6) When ammunition is stacked under cover, the tops of the stacks will be below the level of the eaves to avoid the heated space directly beneath the eaves. The bottom layer should be at least 2 inches off the floor. Dunnage should be level.

(7) Stacks should not be so high that ammunition or its containers in the lower layers will be crushed or deformed.

(8) Partly filled boxes should be fastened securely, marked, and placed on top of the stack.

(9) Doors of storage places should be closed

while locomotives or motor trucks are passing or stopping. Truck motors should not be started while the doors of the storage places are open.

(10) Small-arms ammunition is not dangerous to handle, but workers must be careful to keep the boxes from being broken or damaged.

(11) Small-arms ammunition should be stored under cover whenever possible. This applies particularly to tracer and shotgun ammunition. Tracer ammunition, when damp, is subject to rapid deterioration and may ignite spontaneously. Shotgun shells are not packed in waterproof metal-lined boxes except for oversea shipment. Never expose ammunition directly to rays of the sun.

(12) Ammunition should be stored in the original containers in a dry, well-ventilated place and protected against excessive heat.

(13) Ammunition boxes should not be opened until the ammunition is required for use. Ammunition removed from airtight containers, particularly in damp climates, will corrode and become unserviceable.

(14) Ammunition should be protected carefully from mud; sand, dirt, and water.

(15) Personnel handling ammunition should clean all mud and grit from their shoes before entering the magazine, car, or boat in which there are explosives or ammunition.

(16) Safety shoes, devoid of metal plates and nails, should be worn whenever explosive dust is present.

(17) Bale hooks will not be used on cases of

ammunition. Containers will not be tumbled, dragged, thrown, or dropped on each other or on the floor.

(18) Interiors of magazines should be clean. Paint, oil, gasoline, waste, rags, and other inflammable material should not be left in magazines.

(19) Smoking, matches, and the use of lights other than approved electric lights are forbidden.

(20) If cases are dragged across the floor of the magazine, fires may result from powder dust on the floor.

(21) Ammunition should be stored and piled according to type and ammunition lot number. Extreme care must be exercised to prevent the mixing of ammunition lots in one pile.

30. ICING REFRIGERATOR CARS. Work details may be assigned the job of icing or re-icing refrigerator cars at depots or at re-icing points along rail lines. Refrigerator cars have four brine tanks at each end of the car. They are placed side by side across the end of the car with hatches at the top for charging with ice, and drains at the bottom for releasing the spent brine. The tanks vary in size with the type of car. However, in cars built for transporting meat, each tank holds about 700 pounds of ice, or about 5,600 pounds for the car. The amount of salt used varies with the degree of refrigeration required, the season of the year, and the climate of the country to be crossed. The greater the amount of salt, the lower the temperature obtainable. In ordinary situations 12-percent salt will bring the tempera-

ture inside the car to 30° F. or slightly below; 15-percent salt will keep frozen meats in an unthawed state. Shipping orders and bills of lading contain detailed icing instructions which give the frequency of re-icing (usually each 24 hours) and indicate the percent of salt to be used. When icing refrigerator cars the following procedure is used:

a. Initial icing. Refrigerator cars must be precooled before they are loaded. In general, cars must be properly precooled by icing the day before loading, re-iced the same day, and then re-iced a second time the day of loading. Initial icing is done in the following manner:

(1) Close the drainage plugs.

(2) Be sure the ice is clean and free from foreign matter such as straw, hay, sawdust, and chips. Crush the ice into pieces averaging about the size of a man's fist.

(3) Pour the crushed ice in through the hatch openings, gradually adding the required percentage of No. 2 rock salt so that it is uniformly mixed through the ice.

(4) Tamp the ice and salt mixture into a compact mass so as to fill the hatches completely.

(5) Tightly close the hatch plugs after the tanks have been filled to prevent leakage of the brine formed by the melting ice.

b. Re-icing. When the cars must be re-iced, the ice remaining in the tanks is tamped down and the excess brine is drawn off through the drainage openings. The same percentage of salt is used as was used in the initial icing. One-third

of the total quantity of salt to be used is added to the old ice, and the remaining two-thirds is mixed with the new ice. The tanks are filled to capacity, tamped down, and the hatches closed as in the initial icing.

31. SAFEGUARDING MILITARY INSTALLATIONS AND

SUPPLIES. a. Interior guard. Service companies are frequently called upon to provide personnel to safeguard military installations such as motor parks, depots, and dumps. This duty is similar to interior guard performed at posts, camps, and stations. FM 26-5 or an authorized standing operating procedure will be followed.

b. Patrols. Small patrols are sometimes used to guard installations either by patrolling a given area or by visiting sentry posts. Personnel engaged in this type of duty should be familiar with FM 21-75.

c. Truck guards. (1) When operating in areas where natives are unfriendly or where there is danger of "hijacking," trucks are provided with a truck guard. Usually, this guard consists of one man who sits on top of the load, weapon in hand. He is given responsibility for the load and must protect it from persons who would steal packages when the truck is stopped or who would attempt to stop the truck and "hijack" the vehicle and its load.

(2) When trucks are being loaded and unloaded by native personnel or prisoners of war, the truck guard has sometimes been made both a checker and a guard. He checks the number of

packages coming into the truck, verifies his count with the regular checker, and signs for the load. He accompanies the load to the destination, checks the packages off the truck, and is relieved of his responsibility when given a signed release by the receiving agency. This system has proved very helpful in areas with bad roads and undependable natives, and when the truck drivers are busy driving and caring for their vehicles.

d. Train guards. Train guards are a variation of truck guards. When there is danger of pilferage and stealing from trains while en route, service company personnel may be assigned duty to ride the freight cars and protect the supplies.

32. ASSISTING GRAVES REGISTRATION PERSONNEL.

Work details from Quartermaster service companies may help personnel of the Graves Registration Service accomplish their mission. Work done by service troops will be performed under the supervision of specially trained personnel as prescribed in FM 10-63.

33. ASSISTING IN FIRE PROTECTION. Details from service companies may be assigned to supplement engineer personnel in providing fire protection. Persons assigned this work should be familiar with the information given in TM 5-315.

34. ASSISTING IN SALVAGE OPERATIONS. In connection with salvage operations, service company personnel may help in the collection, segregation, and repair of salvage under the direction of

trained persons from either salvage collecting companies or salvage repair companies. Detailed information for this work may be found in the following publications: TM 10-260, TM 10-265, and TM 10-266.

35. ASSISTING LAUNDRY, STERILIZATION, AND FUMIGATION AND BATH UNITS.

a. When work details are assigned to laundry, sterilization, or fumigation and bath units, they normally assist in setting up equipment, in handling supplies, in loading and unloading clothing and equipment to be processed, or in directing personnel served by the bath units. This work is supervised by technical personnel of the unit according to its operating procedures.

b. If it should become necessary for men of the service company to operate any of the machines, they should be given on-the-job training by skilled operators and then should work under close supervision until they have mastered the operation. The following publications may prove helpful:

- (1) *Laundry.* TM 10-351 and TM 10-352.
- (2) *Sterilization.* TM 10-640 and TM 10-641.
- (3) *Fumigation and bath.* TM 10-645, TM 10-1612, and TM 10-1616.

36. ROAD BUILDING AND REPAIR.

a. Ordinarily, service company personnel assisting in road building will be used only in the construction of hasty roads. However, they may be called upon to build paved roads, prepare roadbeds, and perform other duties under supervision. Hasty roads built by

service companies are usually constructed in their bivouac areas and in and around depots, dumps, and other installations where service companies may be working. Road maintenance consists chiefly of emergency repair and ditching for drainage. Service company details will clear and trim road areas, dig drainage canals, construct culverts, fill in bombed or shelled areas, and do other required work.

b. Detailed information for the building of the different types of hasty roads is found in FM 5-10.

37. GENERAL CONSTRUCTION. Service company personnel may be called upon to help in various types of construction ranging from the building of native type shelters for supplies to permanent buildings. Normally, the work will be done under the supervision of trained personnel. The following are the general types of work assigned:

a. **Camouflage of installations.** Work done in camouflaging large installations such as depots or dumps is usually directed by technicians. Detailed information for the camouflage of installations is found in the following manuals: FM 5-20, FM 5-20A, FM 5-20B, FM 5-20C, and FM 5-20H.

b. **Field fortifications.** The construction of field fortifications is discussed in FM 5-15.

c. **Bivouac area improvement.** When the company and the installation being served are semi-permanently located, details will be assigned to build roads, walks, sanitary facilities, improvised shelters, drainage systems, and other improve-

ments for the area. FM 21-10 and FM 5-10 will provide helpful data.

d. Reclamation of captured areas. When moving into areas captured from the enemy, service company troops may be called upon to clean up rubble, to tear down buildings damaged beyond repair, and to repair other damaged buildings. The following manuals will be helpful: TM 5-226, TM 5-280, FM 5-10, and FM 5-25.

38. ASSISTING IN PORT OPERATIONS. Generally, skilled personnel operate the machinery for unloading ships, and service company personnel may work both in the holds and on the docks. Men working in the holds load slings with supplies as directed. Men on the docks handle the supplies after they are placed on the docks. Their work consists of sorting, loading, and stacking. Other details may guard the docks, direct traffic, and perform housekeeping duties.

39. ASSISTING IN PITCHING TENTS FOR HOSPITALS, SUPPLY POINTS, AND HEADQUARTERS. Tent-pitching details should follow the procedures described in FM 20-15.

40. ASSISTING IN PACK TRANSPORTATION. Service companies have been called upon to assist in pack transportation. Detailed information about this type of operation is found in FM 25-7.

APPENDIX I

MAXIMUM BULK LOADING FOR STANDARD U. S. FREIGHT CARS

1	2	3	4
Rated capacity of cars in tons.....	30	40	50
Item	Actual capacity of cars in tons		
Ammunition.....	30	40	50
Barbed wire.....	30	40	50
Blankets, baled.....	27	32	40
Bread.....	19	24	30
Canned goods, boxes.....	30	36	45
Cement.....	30	40	50
Clothing, baled.....	27	32	40
Flour.....	30	40	50
Gravel.....	30	40	50
Harness and saddlery.....	18	20	30
Hay, baled.....	15	20	25
Iron, corrugated.....	30	40	50
Meat.....	15	24	35
Motor vehicle parts.....	24	28	40
Oats.....	18	24	30
Rails.....	30	40	50
Rifles, in chests.....	30	40	50
Sand.....	30	40	50
Sandbags.....	21	24	30
Stone, any form.....	30	40	50
Sugar.....	30	40	50
Telephone wire.....	30	40	50
Tentage.....	15	20	30
Ties, railroad.....	19	26	32
Tools, engineer.....	30	40	50
Tools, truck.....	30	40	50

Note. A rated capacity of a car in tons does not mean that this rated tonnage of all articles can be carried. This table shows the tonnage of military freight which can be carried in freight cars of common rated capacities.

APPENDIX II

CHARACTERISTICS OF STANDARD RATIONS

	1	2	3	4	5	6
1	Type ration	Number rations per package	Weight per package (lb.)	Volume per package (cu. ft.)	Average weight per ration including packing (lb.)	Average weight per ration unpacked (lb.)
2	A-----	-----	-----	*-----	6.0	6.0
3	B-----	-----	-----	*-----	6.0	6.0
4	C-----	8	42.0	1.1	5.25	4.0
5	D-----	48	51.0	1.09	1.06	0.75
6	K-----	12	43.0	1.2	3.58	2.30
7	10-in-1---	10	49.0	1.5	4.5	-----
8	Special hospital ration.	25	60.0	1.6	2.4	-----
9	Grain-----	-----	-----	-----	-----	10
10	Hay-----	-----	-----	-----	-----	14

*For planning purposes, volume may be taken as 0.1462 cubic feet per ration

APPENDIX III **TONNAGE REQUIREMENTS OF CLASS I AND** **CLASS III SUPPLIES (APPROXIMATE)**

Item	Hundreds of rations							
	100	200	300	400	500	600	700	800
A or B ration.....	.3	.6	.9	1.2	1.5	1.8	2.1	2.4
C ration.....	.2	.4	.65	.85	1.5	1.25	1.45	1.7
D ration.....	.05	.1	.15	.2	.25	.3	.35	.4
K ration.....	.15	.3	.45	.6	.75	.9	1.1	1.3
10-in-1 ration.....	.25	.49	.74	.98	1.23	1.47	1.72	1.96
Gasoline,* oil, water (can included).....	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Grain ration.....	.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Hay ration.....	.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6

Note. All weights are approximate tonnage.
 *Approximate tonnage per hundreds of gallons (not per hundreds of rations).

APPENDIX IV

LOADING OF CLASS V SUPPLIES

Item*	Containers per ton	Containers per 2½-ton truck	Containers per 2½-ton truck with 1-ton trailer
Carbine, .30-caliber	28.6	71	99
Grenade, fragmentation	40.0	100	140
Grenade, rifle, M-9	65.0	162	227
Grenade, rifle, M-9A1	65.0	162	227
Gun, 4.5-inch	28.0	71	99
Gun, 8-inch	5.0	13	18
Gun, 75-mm	29.4	73	102
Gun, 155-mm (complete round)	14.3	37	51
Gun, antiaircraft, 3-inch	13.2	33	46
Gun, antiaircraft, 37-mm	23.6	59	82
Gun, antiaircraft, 40-mm	13.0	32	45
Gun, antiaircraft 90-mm	8.7	21	29
Gun, antitank, 37-mm	20.0	50	70
Gun, tank, 3-inch	13.2	33	46
Howitzer, 8-inch	8.0	20	28
Howitzer, 75-mm	29.0	72	101
Howitzer, 105-mm	13.0	32	45
Howitzer, 155-mm (complete round)	19.1	47	66
Howitzer, M-1, 155-mm	19.0	47	66
Howitzer, 250-mm	5.0	12	17
Light, signal, Very	64.6	161	225
Machine gun, .50-caliber	20.8	52	72
Mines, antitank, cased	36.0	74	110
Mines, antitank, uncased	200.0	500	700
Mortar, 60-mm	24.6	61	85
Mortar, 81-mm (heavy projec- tile)	45.5	114	159
Mortar, 81-mm (light projectile)	22.0	55	77
Mortar, chemical, 4.2-inch	30.0	75	105
Pistol, ball, .45-caliber	18.2	45	63
Rifle, ball, .30-caliber	19.8	49	68
Rocket, 2.36-inch	14.8	37	51
Signals, ground	32.0	80	112

*In most cases, there are several different types of ammunition in each caliber, differing slightly in weight. Data shown are for a representative type in each caliber.

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